

<b>APPENDIX F: THERMAL CYCLER 9600 HEATER, CHILLER, TEMPERATURE UNIFORMITY, AND TEMPERATURE CALIBRATION VERIFICATION DIAGNOSTIC TESTS</b>	Page 1 of 7
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<p><b>APPENDIX F: THERMAL CYCLER 9600 HEATER, CHILLER, TEMPERATURE UNIFORMITY, AND TEMPERATURE CALIBRATION VERIFICATION DIAGNOSTIC TESTS.</b></p> <p>1. DNA THERMAL CYCLER 9600 HEATER TEST</p> <p>1.1 At the main menu, press the OPTIONS key to move the cursor to the UTIL.</p> <p style="padding-left: 40px;">Select Options 9600 RUN- CREATE - EDIT -<u>U</u>TIL</p> <p>1.2 Press ENTER. The utilities menu appears:</p> <p style="padding-left: 40px;">Select Function <u>D</u>IR - CONFIG - DIAG - DEL</p> <p>1.3 Press the OPTION key to move the cursor to the DIAG, press enter. The following display appears:</p> <p style="padding-left: 40px;">Enter Diag Test # 1 Review History File</p> <p>1.4 Run the Heater Test by pressing 2, then ENTER. The following display appears:</p> <p style="padding-left: 40px;">Heater Test Blk = xx.x Going to 35°C...</p> <p style="padding-left: 40px;">When the temperature stabilizes, full power is applied to all heaters. The display reads “Ramping....”, then “Timing...” and the block temperature is monitored.</p> <p style="padding-left: 40px;">When the block reaches the setpoint, the following screen appears:</p> <p style="padding-left: 40px;">Heater Test Passed</p> <p style="padding-left: 40px;">This display will show “Passed” if the test was successful. If the test was not successful, the display will show “Failed”. If this should occur, contact an authorized vendor.</p> <p>1.5 Press STOP to return to the first diagnostics display.</p> <p>1.6 Refer to Appendix I for the appropriate worksheet to record the results.</p> <p>2. DNA THERMAL CYCLER 9600 CHILLER TEST</p> <p>2.1 At the main menu, press the OPTIONS key to move the cursor to the UTIL.</p> <p style="padding-left: 40px;">Select Options 9600 RUN- CREATE - EDIT -<u>U</u>TIL</p>	

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<p>2.2 Press ENTER. The utilities menu appears:</p> <p style="padding-left: 40px;">Select Function DIR - CONFIG - DIAG - DEL</p> <p>2.3 Press the OPTION key to move the cursor to the DIAG, press enter. The following display appears:</p> <p style="padding-left: 40px;">Enter Diag Test # 1 Review History File</p> <p>2.4 Run the Heater Test by pressing 3, then ENTER. The following display appears:</p> <p style="padding-left: 40px;">Chiller Test Blk = xx.x Going to 50°C...</p> <p>The system first waits for the coolant temperature to reach 10°C. If the unit cannot do this within 18 minutes, a failure message will be displayed.</p> <p>When the temperature stabilizes, the system drives the sample block cold, the temperature is monitored for a specific amount of time, and the cooling rate is calculated.</p> <p>When the block reaches the setpoint, the following screen appears:</p> <p style="padding-left: 40px;">Chiller Test Passed</p> <p>This display will show “Passed” if the test was successful. If the test was not successful, the display will show “Failed”. If this should occur, contact an authorized vendor.</p> <p>2.5 Press STOP to return to the first diagnostics display.</p> <p>2.6 Refer to Appendix I for the appropriate worksheet to record the results.</p>	

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<div data-bbox="164 325 1398 354"> 3 DNA THERMAL CYCLER 9600 TEMPERATURE CALIBRATION VERIFICATION TEST </div> <div data-bbox="245 392 795 422"> 3.1 Verifying the Temperature Calibration </div> <div data-bbox="342 459 1516 554"> <p>Perform the procedure as described in the following steps. It is recommended that you perform this procedure immediately after turning the instrument on because the sample block heated cover is not hot at that time.</p> </div> <div data-bbox="342 592 1544 1797"> <div data-bbox="342 592 1425 657"> 3.1.1 If the sample block heated cover is in the forward position, turn the knob completely counterclockwise, then slide the cover back. </div> <div data-bbox="342 695 1133 724"> 3.1.2 Coat wells D1 and E1 with mineral oil using a cotton swab. </div> <div data-bbox="342 762 1487 825"> 3.1.3 Place the probe tray on the sample block so that the probe tray notch faces the front of the instrument. </div> <div data-bbox="342 863 1539 926"> 3.1.4 Place the probe assembly into wells D1 and E1 so that the dummy probe sits in D1. Carefully thread the probe wire through the notch in the probe tray. </div> <div data-bbox="342 963 1544 1026"> 3.1.5 Slide the heated cover forward, then turn the cover knob clockwise until the white mark on the knob is aligned with the white mark on the cover. </div> <div data-bbox="342 1064 1528 1094"> 3.1.6 Turn on the digital thermometer by moving the ON-OFF/RANGE switch to the 200 position. </div> <div data-bbox="342 1131 1232 1161"> 3.1.7 Turn on the GeneAmp PCR System 9600. The main menu appears: </div> <div data-bbox="532 1199 870 1260"> <div data-bbox="532 1199 789 1228">Select Option 9600</div> <div data-bbox="532 1232 870 1260"><u>R</u>N-CREATE-EDIT-UTIL </div> </div> <div data-bbox="342 1297 1474 1360"> 3.1.8 Press the OPTION key three times to move the cursor to UTIL, then press ENTER. The utilities menu appears: </div> <div data-bbox="532 1398 852 1461"> <div data-bbox="532 1398 711 1428">Select function</div> <div data-bbox="532 1432 852 1461"><u>D</u>IR-CONFIG-DIAG-DEL </div> </div> <div data-bbox="342 1499 1536 1562"> 3.1.9 Press the OPTION key twice to move the cursor to DIAG, then press ENTER. The following display appears: </div> <div data-bbox="532 1600 764 1663"> <div data-bbox="532 1600 755 1629">Enter Diag Test #<u>1</u></div> <div data-bbox="532 1633 764 1663">Review History file </div> </div> <div data-bbox="342 1701 1500 1797"> 3.1.10 Run the Verify Calibration Diagnostic Test (Test #5) by pressing 5 then ENTER.  * The temperature of the sample block and heated cover will go to 40°C, and the following display will appear: </div> </div> <div data-bbox="532 1835 802 1898"> <div data-bbox="532 1835 724 1864">Going to 40°C...</div> <div data-bbox="532 1869 802 1898">Cvr= xxC Blk = xx.xC </div> </div>	

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<p>This display shows the current temperature of the block cover (Cvr= xx°C) and sample block (Blk = xx.x°C).</p> <p>* When the temperature of the block cover is within ten degrees of the sample block temperature, the following display appears:</p> <p style="padding-left: 40px;">Wait 3 minutes... Time=MM:SS Blk=40.0C</p> <p>This display shows the current sample block temperature ("Blk=40.0C") and a clock, which counts up from zero in minutes and seconds ("Time=MM:SS").</p> <p>* When the clock reaches three minutes, the following display appears:</p> <p style="padding-left: 40px;">Record Temperature Time=MM:ss Blk=40.0C</p> <p>3.1.11 Measure the temperature of well E1 using the digital thermometer. Record this temperature as T(40).</p> <p>3.1.12 Press ENTER.</p> <p>* The temperature of the sample block and heated cover will go to 95°C, and the following display will appear:</p> <p style="padding-left: 40px;">Going to 95°C... Cvr= xx°C Blk = xx.x°C</p> <p>This display shows the current temperature of the block cover (Cvr= xx°C) and sample block (Blk = xx.x°C).</p> <p>* When the temperature of the block cover is within ten degrees of the sample block temperature, the following display appears:</p> <p style="padding-left: 40px;">Wait 3 minutes Time=MM:SS Blk=95.0C</p> <p>This display shows the current sample block temperature ("Blk=95.0C") and a clock, which counts up from zero in minutes and seconds ("Time=MM:SS").</p> <p>* When the clock reaches three minutes, the following display appears:</p> <p style="padding-left: 40px;">Record Temperature Time=MM:SS Blk=95.0C</p> <p>3.1.13 Measure the temperature of well E1 using the digital thermometer. Record this temperature as T(95).</p>	

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<div data-bbox="248 352 487 384" data-label="Section-Header"> <h3>3.2 Test Results</h3> </div> <div data-bbox="342 420 1365 453" data-label="Text"> <p><b>NOTE:</b> Refer to Appendix I for the appropriate worksheet to record the results.</p> </div> <div data-bbox="342 489 1065 522" data-label="Text"> <p>Perform the following steps to calculate the results of the test:</p> </div> <div data-bbox="342 558 1409 590" data-label="Section-Header"> <h4>3.2.1 Use the following formula to calculate the average block temperature at 95°C hold:</h4> </div> <div data-bbox="436 623 1526 724" data-label="Text"> <p>Block Average at 95°C = <math>T(95)</math> - High Offset for the individual thermal cycler. (The High Offset value can be obtained from the label with the instrument's specifications provide with the specific 9600 thermal cycler).</p> </div> <div data-bbox="436 756 1537 821" data-label="Text"> <p>* If the block average is more than 0.75°C above or below 95°C, your GeneAmp PCR System 9600 must be recalibrated.</p> </div> <div data-bbox="342 856 1451 890" data-label="Section-Header"> <h4>3.2.2 Use the following formula to calculate the average block temperature at the 40°C hold.</h4> </div> <div data-bbox="436 924 1526 1024" data-label="Text"> <p>Block Average at 40°C = <math>T(40)</math> - Low Offset for the individual thermal cycler. (The Low Offset value can be obtained from the label with the instrument's specifications provide with the specific 9600 thermal cycler).</p> </div> <div data-bbox="436 1058 1537 1123" data-label="Text"> <p>* If the block average is more than 0.75°C above or below 40°C, your GeneAmp PCR System 9600 must be recalibrated.</p> </div>	

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<p>4 DNA THERMAL CYCLER 9600 TEMPERATURE UNIFORMITY TEST</p> <p>4.1 Testing the Temperature Uniformity</p> <p>Perform the procedure as described in the following steps:</p> <p>4.1.1 If the sample block heated cover is in the forward position, turn the cover knob completely counterclockwise, then slide the cover back.</p> <p>4.1.2 Coat all the wells in sample block rows A, C, E, and H with mineral oil using a cotton swab.</p> <p>4.1.3 Place the probe tray on the sample block with the notch facing the front of the instrument.</p> <p>4.1.4 Place the probe assembly into wells A1 and A2 so that the dummy probe sits in A2. Carefully thread the probe wire through the notch in the probe tray.</p> <p>4.1.5 Slide the heated cover forward and turn the cover knob clockwise until the white mark on the knob and the white mark on the cover are aligned.</p> <p>4.1.6 Turn on the digital thermometer by moving the ON-OFF/RANGE switch to the 200 position.</p> <p>4.1.7 Turn on the GeneAmp PCR System 9600 and create a two-temperature CYCLE program with the following parameters:</p> <p style="padding-left: 40px;">Setpoint #1 Temperature = 95°C Hold Time = 2:00 minutes Ramp Time = 0:00 minutes</p> <p style="padding-left: 40px;">Setpoint #2 Temperature = 40°C Hold Time = 2:00 minutes Ramp Time = 0:00 minutes</p> <p style="padding-left: 40px;">Cycles = 99</p> <p>4.1.8 On the third cycle, measure the temperature of well A1 90 seconds into Setpoint #1 (95°C setpoint temperature) using the digital thermometer. The time remaining on the clock run-time display will read "0:30" (30 seconds). Record this temperature.</p> <p>4.1.9 Still on the third cycle, measure the temperature of well A1 90 seconds into setpoint #2 (40°C setpoint temperature) using the digital thermometer. The time remaining on the clock run-time display will read "0:30" (30 seconds). Record this temperature.</p> <p>4.1.10 After you measure the second temperature of well A1, turn the cover knob completely counterclockwise, then slide the heated cover back.</p> <p>4.1.11 Move the probe assembly to wells A4 and A5, placing the dummy probe in A5.</p>	

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<div data-bbox="342 317 1549 758"> <p>4.1.12 Slide the heated cover forward, then turn the cover knob clockwise until the white mark on the knob and the white mark on the cover are aligned. Repeat steps 4.1.8 and 4.1.9 for fourth cycle.</p> <p>4.1.13 Repeat the measurements (as specified in 4.1.8 and 4.1.9 for cycles 4 and so on) on wells A4, A8, A12, C1, C4, C8, C12, E1, E4, E8, E12, H1, H4, H8, and H12. Make sure you place the measuring cone of the probe assembly into these wells and the dummy probe into adjacent wells.</p> <p>4.1.14 After you have completed all measurements, remove the probe assembly from the sample block and turn off the digital thermometer.</p> <p>4.1.15 Clean the oil from the sample block using cotton swabs.</p> </div> <div data-bbox="245 789 487 821"> <p>4.2 Test Results</p> </div> <div data-bbox="342 852 1365 894"> <p><b>NOTE:</b> Refer to Appendix I for the appropriate worksheet to record the results.</p> </div> <div data-bbox="342 915 1520 1094"> <p>4.2.1 For the 16 Setpoint #1 measurements (95°C hold), subtract the lowest measured temperature from the highest measured temperature.</p> <p>4.2.2 For the 16 Setpoint #2 measurements (40°C hold), subtract the lowest measured temperature from the highest measured temperature.</p> </div> <div data-bbox="342 1125 1503 1188"> <p>* If either result is more than 1°C, your GeneAmp PCR System 9600 must be serviced by a Perkin-Elmer Service Representative.</p> </div> <div data-bbox="1463 1230 1549 1262"> <p>◆END</p> </div>	